# Ten Tips for PubMed®

If you are a biomedical researcher, clinician, teacher, or student you probably have used or will use MEDLINE® for most of your literature searching. The NIH Library provides access to MEDLINE in three ways: via the Entrez PubMed search system from the National Library of Medicine, via the Ovid® platform, and via the Web of Science® platform. Which one you use is mostly a matter of personal preference, though each has its advantages. PubMed is an expanded version of *MEDLINE*, with not only the core medical database but also articles that haven't been fully processed into MEDLINE yet and other articles that, for various reasons, are searchable but will never be fully processed as MEDLINE records. All told, PubMed contains more than 19 million citations and can be searched for free from anywhere in the world. The system is very powerful but not always fully intuitive. We recognize that you may have specific search strategies that you want to learn how to do in *PubMed*. While you are always welcome to attend a class or get a one-on-one tutorial (see our Resource Training page at http://nihlibrary.nih.gov/ResourceTraining/), you may want to use the following ten tips for self-study or as a reference:

- 1. The Basics Simple Searching and Viewing Results
- 2. Setting Limits
- 3. Combining Searches Using History
- 4. Viewing Full-Text Documents
- 5. Saving, Emailing, and Printing Items
- 6. MyNCBI: Saving Searches
- 7. Using MeSH Subject Headings
- 8. EBM/Clinical Queries
- 9. The Single Citation Matcher
- 10. Getting More Help

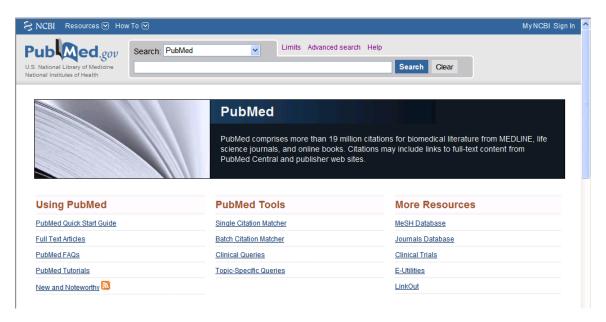
Bonus Tip 11: *National Library of Medicine: PubMed Basics* <a href="http://nnlm.gov/training/resources/pmtri.pdf">http://nnlm.gov/training/resources/pmtri.pdf</a>

This handout is adapted with permission from *PubMed Ten Tips*, Health Sciences Library, UNC-Chapel Hill (<a href="http://www.hsl.unc.edu/Services/Guides/pubmed10.cfm">http://www.hsl.unc.edu/Services/Guides/pubmed10.cfm</a>).

### 1. The Basics – Simple Searching and Viewing Results

It is very important that you enter *PubMed* via the links on either our homepage (<a href="http://nihlibrary.nih.gov/">http://nihlibrary.nih.gov/</a>) or our Databases page (<a href="http://nihlibrary.nih.gov/ResearchTools/Pages/default.aspx?srchType=ViewDatabases&isFirst=yes">http://nihlibrary.nih.gov/ResearchTools/Pages/default.aspx?srchType=ViewDatabases&isFirst=yes</a>). Doing so ensures you have access to added features of *PubMed* that are only available to NIH staff, including full-text access to the electronic journals covered under the NIH Library subscriptions.

The starting *PubMed* screen has a search box on the top and three vertical columns in the lower part: **Using PubMed** contains links to help pages, **PubMed Tools** (several of which are discussed in this guide) link to preformatted expert search boxes and **More Resources** provide link updates, tutorials and additional searching tools. Above the search box there is a pull down box allowing the selection of the database in which you want to search (in our case, *PubMed*).



To begin searching, simply type your keyword(s) into the search box. *PubMed* will attempt to match (or "map") your keyword(s) to appropriate MeSH terms. If you type in more than one keyword or phrase, connect them with the Boolean connectors **AND**, **OR**, or **NOT**. Make sure your connectors are in ALL CAPS! Click 'Search' to run the search.



Your initial results will be displayed below the gray bar. The database defaults to showing a 'Summary' view (citation only) of articles in reverse chronological order.

The "<u>Display Settings</u>" link on top of the results list shows the options indicating the amount and format of information for each citation. Select 'Abstract' from the pull-down menu to see the full citation, related records information and links to full text articles. *PubMed* will automatically switch to the newly selected display type.



### Options include:

- Summary (html or text) Abbreviated author and title, PMID (PubMed Unique Identifier)
- Abstract (html or text) Citation and abstract and links to related records and full text
- MEDLINE (text only) All information available, marked in tagged format (use for reference formatting software such as EndNote® and Reference Manager®).
- PMID list of all PMIDs numbers retrieved from results citations.

In addition, you can change the number of articles shown on a screen and/or the order in which they are shown (by date, author, or journal) by selecting an option from the pull-down menus.

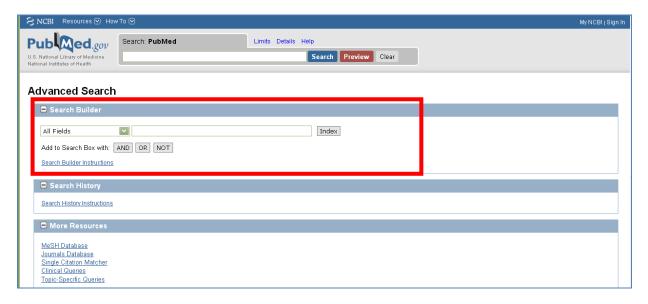
#### **Advanced Search**

The Advanced Search module allows you to create more specific or complex search queries using the additional search tools:

- Limiting searches
- Previewing the number of search results
- Displaying the <u>search details</u>
- Combining searches using history
- Searching by a <u>specific field</u>
- Browsing the index of terms



Use the **Search Builder** to select specific fields to search in such as Author, Title, Journal. Click AND, OR, NOT to add the selected term and field to the PubMed search box.



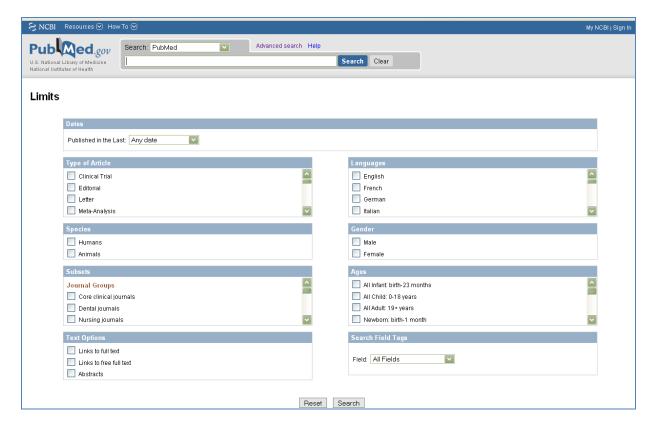
# 2. Setting Limits

You can limit your search by <u>full text or free full text</u>, <u>type of article</u>, <u>age groups</u>, <u>gender</u>, <u>humans or animals</u>, <u>languages</u>, <u>type of article</u>, and <u>subsets</u>.

Access the Limits by clicking on **Advanced Search** or **Limits**.



**Note:** When Limits are selected a **Limits Activated** portlet will display on the results page. To turn off limits click Remove and run a new search.



**For example**, if you are interested in early-onset cancers in women, you could choose **Adult: 19-44** from the 'Ages' menu, **Humans** from the 'Humans or Animals' menu, and **Female** from the 'Gender' menu. Likewise, you can select from a variety of article types (e.g., clinical trial, review, editorial, etc.), languages, subsets (subject-based journal collections), date, and in what field your keyword(s) should appear.

Once you have selected your limits, make sure your keywords are visible in the search box, and click 'Search'. *PubMed* automatically applies your limits to everything else you search in this session unless you turn the limits off.

After a few minutes, it's easy to forget that you had set limits and you may end up getting strange search results. Check to see if there is a **Limits Activated**: Change Remove link.

Either click on Remove link or click on Remove link to modify your limits from search to search.

NOTE: Setting limits in a search will remove non-*MEDLINE* citations from your search (e.g., articles that are too new to have been processed, etc.), because these articles have not yet been indexed with the MeSH and codes that make the Limits feature work.

## 3. Combining Searches Using History

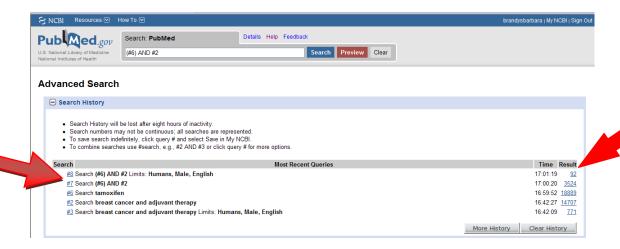
Previous searches can be combined or used in subsequent searches using the search statement number from History.

- 1. Click Advanced Search.
- 2. In the **Search History** section, click the search statement number to display the options menu that includes Boolean operators "AND, OR, NOT". Select one to apply in the search box. Alternatively you can enter a number sign followed by the search number, e.g., #1, in the search box. Other menu options include:
  - Delete the search from the History
  - Go to re-run the search
  - Select "Details" to display the search details
  - Save in My NCBI
- 3. Add additional search terms into the search box or combine with other searches.
- 4. Click Search.

### More information about the History:

- The Search History will be lost after 8 hours of inactivity.
- Click Clear History to delete all searches from History.
- PubMed will move a search statement number to the top of the History if a new search is the same as a previous search.
- History search numbers may not be continuous because some numbers are assigned to intermediate processes, such as displaying a citation in another format.
- The maximum number of searches held in History is 100. Once the maximum number is reached, PubMed will remove the oldest search from the History to add the most current search.
- A separate Search History will be kept for each database, although the search statement numbers will be assigned sequentially for all databases.

- PubMed uses cookies to keep a history of your searches. For you to use this feature, your Web browser must be set to accept cookies.
- Citations in the Clipboard are represented by the search number #0, which may be used in Boolean search statements. For example, to limit the citations you have collected in the Clipboard to English language citations, use the following search: #0 AND English [la]. This does not change or replace the Clipboard contents.



## 4. Viewing Full-Text Documents

When you look at an article listed in the 'Abstract' display, you will see one or more colorful buttons. If you used one of our links to access *PubMed* (see Tip #1), every article will show at least one button:



Simply click the 'NIH Library Full-Text Plus!' button to go to the article. A new window will open and you will be given a link to the article itself if we have an electronic subscription covering that issue. (If the link doesn't work, please call 301.496.1080.) If the article isn't available online, you will be provided a link to our Order a Document form

(<a href="http://nihlibrary.nih.gov/LibraryServices/Document+Delivery.htm">http://nihlibrary.nih.gov/LibraryServices/Document+Delivery.htm</a>). Please keep in mind that you will have to be on the NIH Campus or using a VPN connection to NIH to access most of our subscription journals and databases.

Some articles will show an icon for *PubMed Central*®:

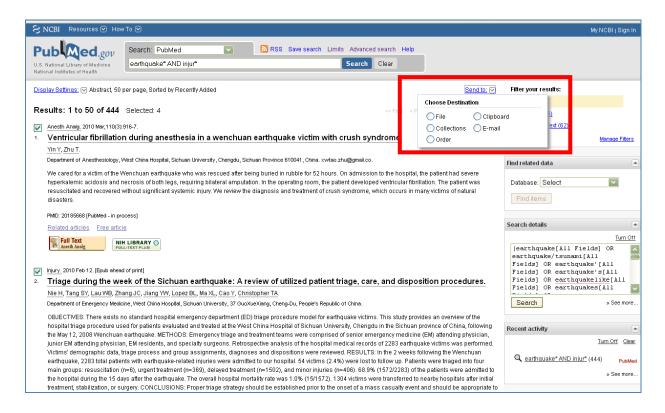


The National Library of Medicine has created a database of free, full-text medical articles. *PubMed Central* contains a number of well-known journals, including the *BMJ: British Medical Journal* and the *Canadian Medical Association Journal*, and specialized journals such as *Critical Care* and *Nucleic Acids Research*. The journals have varying dates of coverage; some go back to 1997, and some include the most recent issues. However, many start with issues published in 2000 and end with issues published a year to six months ago. *PubMed Central* is also a repository for manuscripts of NIH-funded research, per the NIH Public Access Policy (http://publicaccess.nih.gov/).

For many articles, you will also see another button for the publisher. Often this button will take you directly to the article, so feel free to try it, but if it doesn't work, try the 'NIH Library Full-Text Plus!' button. For more information, you may want to read the NLM brochure *Full Text and PubMed*® (<a href="http://nnlm.gov/training/resources/fulltexttri.pdf">http://nnlm.gov/training/resources/fulltexttri.pdf</a>).

## 5. Saving, Emailing, and Printing Items

As you search *PubMed* you may find it useful to temporarily store articles of interest on your clipboard. This feature allows you to keep track of which articles you have already found useful in a previous search in one session with the database.



#### Saving citations temporarily using the Clipboard

The Clipboard gives you a place to collect selected citations from one or several searches. The Clipboard will be **lost after 8 hours of inactivity** on PubMed or on any of the other databases.

You may also save your search results indefinitely using My NCBI Collections.

To **add** citations to the Clipboard:

- In your search results, use the citation check boxes to select citations. To save all your citations do not click any check boxes.
- Use Send to, and select Clipboard.
- To view your selections, click the Clipboard portlet items link.

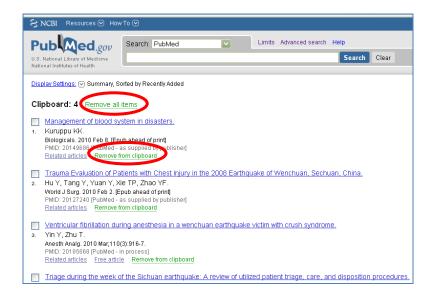


After you add items to your Clipboard, you will return to your search results and at the top of the page a light green bar will appear with a checkmark to confirm the number of items added to your Clipboard.



## To **delete citations** from the Clipboard:

- Use the Remove from clipboard link to delete individual items, or use the check boxes to select items to delete, and then click the Remove selected items link.
- To delete all citations from the Clipboard, do not select any items, click the Remove all link.



### More information about the Clipboard:

- The Clipboard portlet displays the total number of items in the Clipboard.
- The maximum number of items that can be sent to the Clipboard is 500. If you select Clipboard from **Send to** without selecting citations, PubMed will add all (up to 500 citations) of your search results to the Clipboard.
- The Clipboard will not add a citation that is currently in the Clipboard; it will not create duplicate entries.
- PubMed uses cookies to add your selections to the Clipboard. For you to
  use this feature, your Web browser must be set to accept <u>cookies</u>.

## Saving citations as a text file

From your search results, use the citation check boxes to select citations.

- From Send to, select File.
- From Format, select MEDLINE to export to EndNote or Abstract.
- Click Create File. Your Web browser will prompt you to save the PubMed search results in a file on your computer.

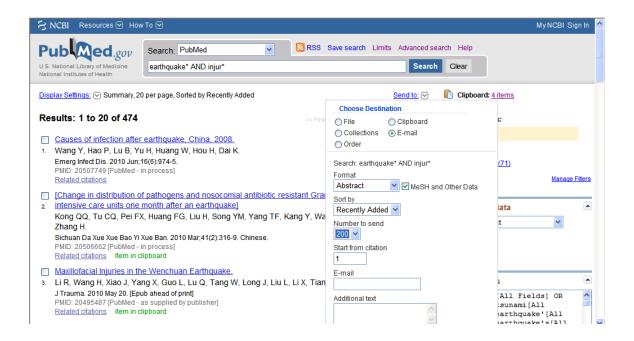


### **E-mailing citations**

- From **Send to**, select **E-mail**.
- Choose selections for Format and Sort by.
- Enter an e-mail address. You may also enter additional text that will be included in the e-mail.
- Click E-mail.

More information about e-mailing citations:

- You may e-mail up to 200 items at a time to a single e-mail address.
- The search will be included in your results e-mail, or a notation indicating the number of selected items.



**Note:** Use My NCBI to create an automatic e-mail update for searches. Your PubMed results will be sent from the NCBI automatic mail server, Sent by Entrez [nobody@ncbi.nlm.nih.gov], with a "Subject" of PubMed Search Results. Do not reply to this message. This is not a functioning customer service e-mail address.

### **Printing Search Results**

Use the print function of your Web browser.

To print citations from different searches, save the citations in PubMed's <u>Clipboard</u>, and then print.

# 6. MyNCBI: Saving Searches

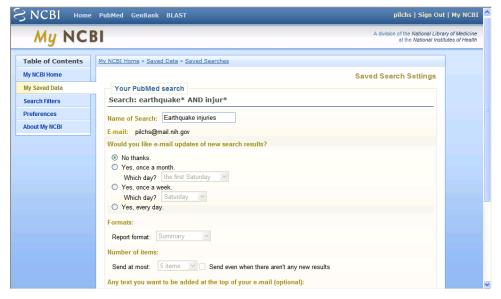
You can save a complicated search for repeated use via the **MyNCBI** system. This will allow you to either manually update the results of your search or to have new citations automatically emailed to you on a regular basis (an "alert" service).

After you have run a search in either the Basic Search or Advanced PubMed, click the 'Save Search' link located at the top of the search box.

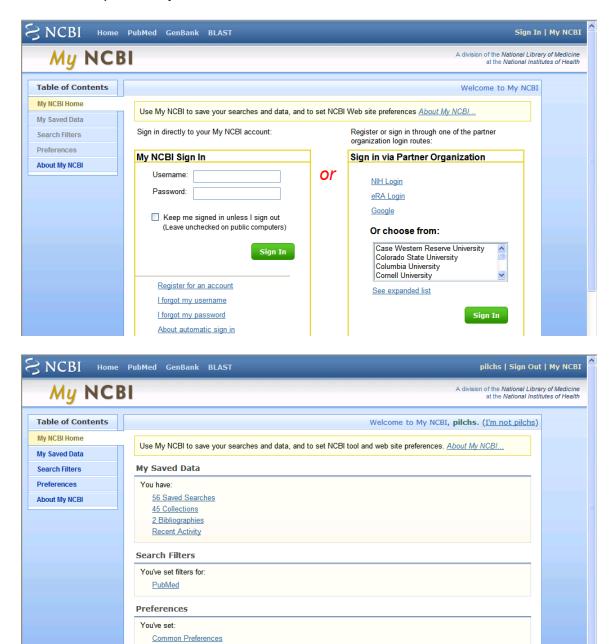


Once you sign in or create a new account, you will be able to select options for storing and retrieving your search, including whether you would like to have the search run automatically on a daily, weekly, or monthly basis.





To **create a MyNCBI account**, click on Sign In from the upper right corner of the PubMed page. You will be prompted to either create a new account or sign in to an account previously created.



The National Library of Medicine has prepared a brochure for those interested in using the MyNCBI system (<a href="http://nnlm.gov/training/resources/myncbitri.pdf">http://nnlm.gov/training/resources/myncbitri.pdf</a>).

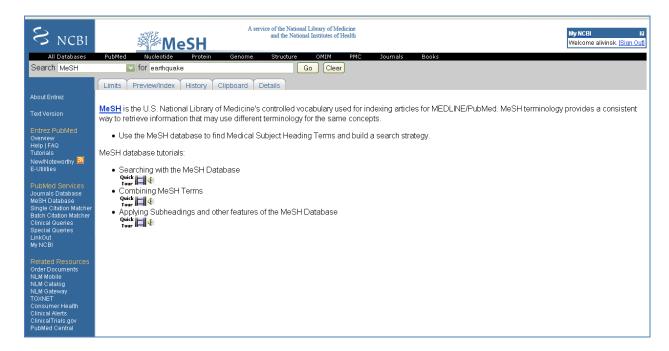
PubMed Preferences

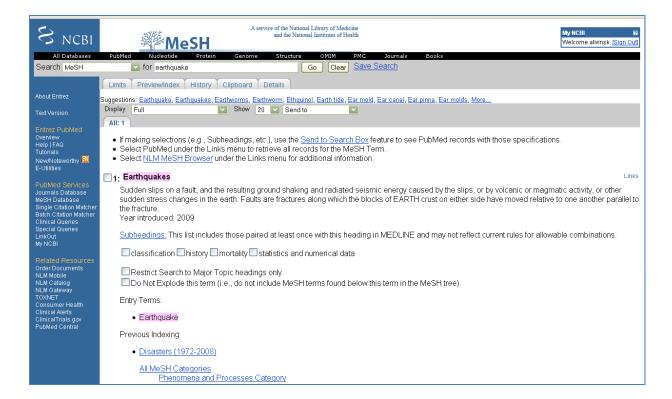
## 7. Using MeSH Subject Headings

There are several ways of discovering the indexing (MeSH) terms in *PubMed*:

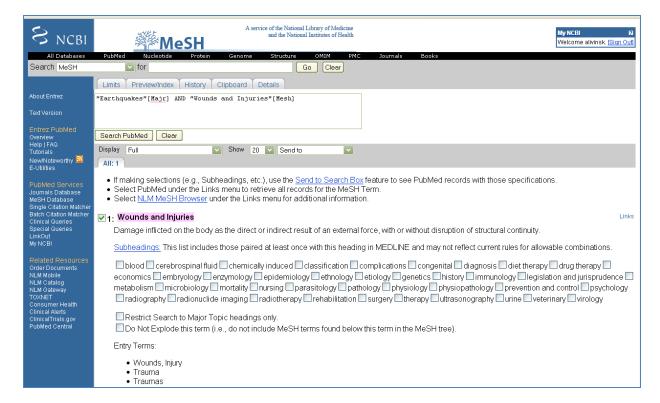
- Click on Display Settings at the top of your search results
  - Select Abstract format from a pull down menu and click on Publication Types, MeSH Terms, Substances link to see the list of the MeSH assigned to each citation with links for further search options
  - Select Medline format from a pull down menu to see the complete listing of MeSH terms assigned to the citations.
- Search for MeSH (Medical Subject Headings) terms using the MeSH Database.

The MeSH Database is listed under More Resources column on the PubMed home page screen. It is also available on the Advanced Search Screen at the bottom of the page. Once in the MeSH Database, enter your keyword into the search box and click 'Go'. Select terms by checking the boxes next to the term name.





Clicking the hyperlinked MeSH term will give you a more complete description of the term, including subheadings, options to limit your search, history of the term, and the placement of the term in the MeSH tree hierarchy. Check the boxes next to subheadings and/or limits you desire. To search the term, click 'Send to Search Box with AND', then click 'PubMed Search'.



One nice feature of searching with MeSH terms is that *PubMed* automatically explodes terms. That is, the database assumes you want to see articles coded not only with the term given but also with more specific terms in the tree hierarchy. This means that a MeSH search for **Extremities** in *PubMed* will include articles indexed under **Foot**, **Ankle**, and **Toes** that would otherwise have been excluded in a non-exploded search.

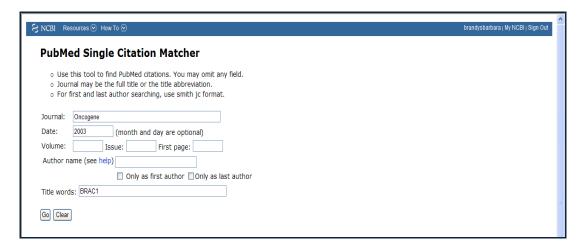
For more information, see the National Library of Medicine brochure Searching PubMed® with MeSH® (http://nnlm.gov/training/resources/meshtri.pdf).

### 8. EBM/Clinical Queries

The Clinical Queries service (also in the blue panel on the left, under PubMed Services) offers three modes of searching for articles to support evidence-based medicine. First, you may wish to search for evidence by clinical study category (etiology, diagnosis, therapy, or prognosis) using a broad (sensitive) or narrow (specific) focus. Second, you can find systematic reviews on a topic. Third, you may look for information on the genetics of a disease, including genetic diagnosis, clinical description, management, counseling, molecular genetics, and genetic testing. All three of these modes use preset filters and search terms that have been designed by researchers at the National Library of Medicine.

## 9. The Single Citation Matcher

Often times you may be looking for a specific article, either because it was recommended to you or because you need to verify the citation for a bibliography. The Single Citation Matcher is a helpful option in the PubMed Services menu in the blue column at the left of your screen. The Single Citation Matcher simplifies your search by offering you a form with spaces for the relevant parts of the citation. You need only fill out one of the boxes, but it is usually a good idea to enter information in at least two:



The above example finds all articles published in *Oncogene* in 2003 that have the word 'BRCA1' in the title. In this case, several articles are found.

## 10. Getting More Help

If you would like more training on using *PubMed*, you may wish to meet with a librarian to search on a particular topic of interest. We are happy to meet with you at your office or ours, generally during business hours. Please let us know who you are and how we can help you, using our Request a Tutorial (<a href="http://nihlibrary.nih.gov/ResourceTraining/Pages/RequestTutorial.aspx">http://nihlibrary.nih.gov/ResourceTraining/Pages/RequestTutorial.aspx</a>) or Ask A Librarian

(http://nihlibrary.nih.gov/LibraryServices/pages/EmailYourQuestion.aspx) form.

Finally, the National Library of Medicine has created a number of useful online training tools for *PubMed*, including an interactive tutorial and a series of animated Quick Tours (<a href="http://www.nlm.nih.gov/bsd/disted/pubmed.html">http://www.nlm.nih.gov/bsd/disted/pubmed.html</a>).